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SmartSonic

SmartWave

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**BINMASTER**

*Taking Control...To A Higher Level*

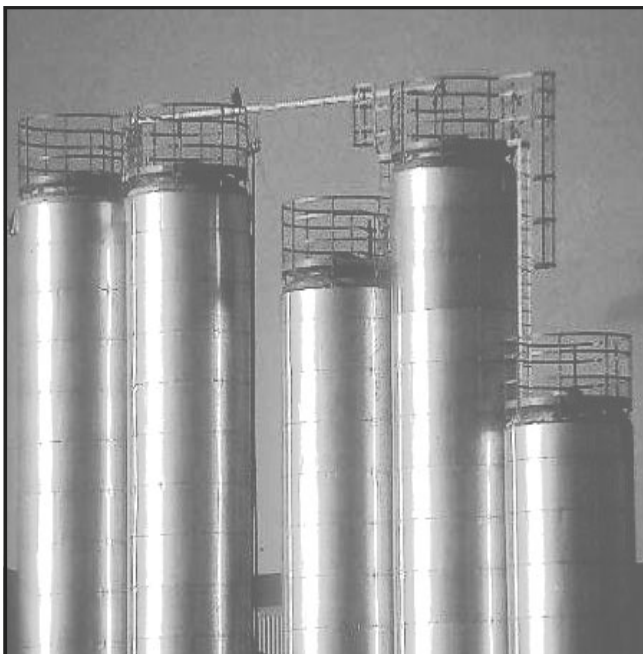
# SmartSonic & SmartWave Level Systems

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SmartSonic and SmartWave are for continuous non-contact level measuring and monitoring of tanks, bins, and silos. The SmartSonic features a variety of ultrasonic transmitters and the SmartWave features a variety of pulse radar transmitters, both with broad processor capabilities that provide remote display and full communication solutions. This plug-and-play design allows us to build a solution that matches your exact needs and is fully scalable for future expansion.

SmartSonic generates an ultrasonic pulse that is sent in the direction of the product in a vessel. The pulse reflects off the product and returns to the sensor in the form of an echo. SmartWave generates an electromagnetic pulse that travels to the surface being monitored and is reflected off the surface back to the sensor. Both transmitters can be programmed to simply send a 4-20 mA analog output signal directly to an existing control system or send data to a PC running a calibration/data logging program using RS-485 communications.

You have bulk-management challenges.  
We have bulk management solutions.  
Simple as that.



## General Features

- **Modular Design**  
Configurable for a number of transmitters, relays, current loops, PC, and PLC interfaces
- **Various Voltage Options**  
Transmitters can be powered with 12 to 30 VDC or 110/230 VAC
- **Push-Button Calibration**  
Full and empty tank distance can be set with a simple push of a button
- **Temperature Compensation**  
Built-in temperature sensor automatically compensates for temperature changes, ensuring consistent accuracy
- **Optional RS-232/485 Communications**  
Interfaces directly to a PC allowing for data collection, parameter changes, and transmitter diagnostics

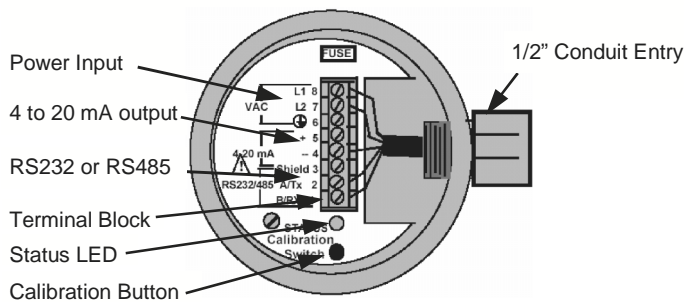
# SmartSonic Ultrasonic Transmitters

1-800-278-4241

## Features

- Power control operation in transmitter
- Easy two point push-button calibration
- Output 4 to 20 mA signal
- Built-in temperature compensation
- Optional RS-232 or RS-485 communications
- Logarithmic receiver with very high dynamic range
- Uniform polar pattern
- Self-cleaning operation

**Top View of Transmitter with Access Cover Removed**



## Technical Specifications

	MODEL	RANGE	RESOLUTION	MOUNTING
110/230 VAC—4 Wire	SS400-25U & UC	1.4-90 ft 0.40-27.4 m	0.41" 10 mm	6.0"/1.0" NPT
	SS400-45U & UC	1.0—60 ft 0.30—18.2 m	0.19" 5 mm	3.0" NPT
	SS400-52U & UC	0.9—50 ft 0.27—15.2 m	0.16" 4 mm	3.0" or 2.0" NPT
	SS400-70U & UC	0.8—30 ft 0.24—9.1 m	0.12" 3 mm	3.0" or 2.0" NPT
	SS400-80U & UC	0.7—20 ft 0.21—6.1 m	0.08" 2 mm	3.0" or 2.0" NPT
	SS400-81U & UC	0.6—16 ft 0.18—4.9 m	0.08" 2 mm	3.0" or 1.5" NPT
	SS400-148U & UC	0.4—9 ft 0.12—2.7 m	0.04" 1 mm	3.0" or 1.0" NPT
12 to 30 VDC—3 Wire	SS300-25U & UC	1.4-90 ft 0.40-27.4 m	0.41" 10 mm	6.0"/1.0" NPT
	SS300-45U & UC	1.0—60 ft 0.30—18.2 m	0.19" 5 mm	3.0" NPT
	SS300-52U & UC	0.9—50 ft 0.27—15.2 m	0.19" 5 mm	3.0" NPT
	SS300-70U & UC	0.8—30 ft 0.24—9.1 m	0.12" 3 mm	3.0" or 2.0" NPT
	SS300-80U & UC	0.7—20 ft 0.21—6.1 m	0.08" 2 mm	3.0" or 2.0" NPT
	SS300-81U & UC	0.6—16 ft 0.18—4.9 m	0.08" 2 mm	3.0" or 1.5" NPT
	SS300-148U & UC	0.4—9 ft 0.12—2.7 m	0.04" 1 mm	3.0" or 1.0" NPT



The new SmartSonic Transmitter features high efficiency, narrow beam design technology using a wide frequency bandwidth to enhance operation in difficult applications. The transmitter performs particularly well in harsh environments where vessel temperatures vary. Also, SmartSonic uses smart signal processing to eliminate unwanted echoes from tank walls, standpipes, and other tank structures that often cause error readings by other ultrasonic devices. The unit's transducer uses a built-in, self-cleaning operation to eliminate buildup or condensation. SmartSonic sensor probes are designed to adapt to the internal tank conditions, automatically adjusting power and receiver sensitivity to any distance and reflecting surface. This technology ensures the same echo is maintained over the entire operating range which enhances measurement accuracy.

### Mechanical

Conduit Entry:

1/2" NPT (PVC conduit only)

Enclosure:

PVC-94VO

Enclosure Rating:

NEMA 4X(IP65)

### Environmental

Temperature:

-40 to 140° F (-40 to 60° C)

Pressure:

1 bar

Approvals:

Entela—CSA/UL

### Operational

Accuracy:

+/- 0.25%

Beam Angle:

6°-12° conical at -3dB

Loss of echo:

Hold 30 seconds, 22 mA

Temperature

Compensation:

Continuous in transducer

Temperature

Sensor Failure:

23 mA

Calibration:

Push-button or

programmable

via optional communication port

# SmartSonic Sanitary Ultrasonic Transmitters

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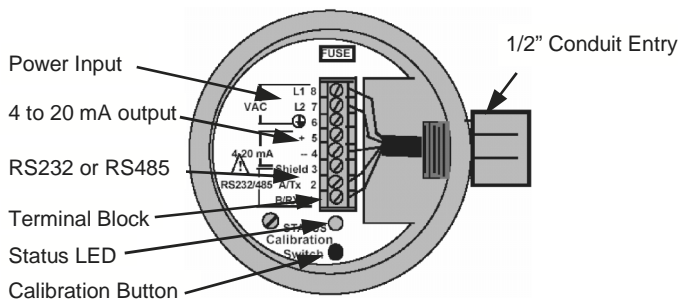
## Features

- 300 series stainless steel face material c/w ferrule mounting base
- Easy two point push-button calibration
- Output 4 to 20 mA signal
- Built-in temperature compensation
- Optional RS-232 or RS-485 communications
- Logarithmic receiver with very high dynamic range
- Uniform polar pattern
- Self-cleaning operation

## Applications

- Food
- Beverage
- Water
- Pharmaceutical

**Top View of Transmitter with Access Cover Removed**



## Technical Specifications

	MODEL	RANGE	RESOLUTION	MOUNTING FERRULE
110/230 VAC—4 Wire	SS400-70US & USC	0.8—30 ft 0.24—9.1 m	0.12\" 3 mm	2.0"
	SS400-80US & USC	0.7—20 ft 0.21—6.1 m	0.08\" 2 mm	2.0"
	SS400-81US & USC	0.6—16 ft 0.18—4.9 m	0.07\" 1.8 mm	1.5"/2.0"
	SS400-148US & USC	0.4—9 ft 0.12—2.7 m	0.04\" 0.98 mm	1.5"/2.0"
12 to 30 VDC—3 Wire	SS300-70US & USC	0.8—30 ft 0.24—9.1 m	0.12\" 3 mm	2.0"
	SS300-80US & USC	0.7—20 ft 0.21—6.1 m	0.08\" 2 mm	2.0"
	SS300-81US & USC	0.6—16 ft 0.18—4.9 m	0.07\" 1.8 mm	1.5"/2.0"
	SS300-148US & USC	0.4—9 ft 0.12—2.7 m	0.04\" 0.98 mm	1.5"/2.0"



The SmartSonic Sanitary Transmitters is built specifically for Food Grade applications where Sanitary Standards apply. The transmitters will cover distances from 5" to 30' using different operating frequencies. Our sanitary ultrasonic transmitters will adapt to any condition. They control transmitter power, receiver sensitivity and reject unwanted echoes. Any buildup on the 300 series stainless steel transducer is removed by the self-cleaning operation.

### Mechanical

Conduit Entry: 1/2"  
NPT (PVC conduit only)  
Enclosure: PVC-94VO  
Enclosure Rating: NEMA 4X(IP65)

### Environmental

Temperature: -40 to 266° F (-40 to 130° C)  
Pressure: 1 bar  
Approvals: Entela—CSA/UL

### Operational

Accuracy: +/- 0.25%  
Beam Angle: 10°-12° conical at -3dB  
Loss of echo: Hold 30 seconds, 22 mA  
Temperature Compensation: Continuous in transducer  
Sensor Failure: 23 mA  
Calibration: Push-button or programmable

Diagnostics: via optional communication port

# SmartWave Pulse Radar Transmitters

1-800-278-4241

## Features

- Low Noise
- Accurate and Reliable
- High Sensitivity
- Self-adjusting amplitude and width of microwave pulse
- Easy two point push-button calibration
- Output 4 to 20 mA signal
- Optional RS-232 or RS-485 communications
- Uniform polar pattern
- No mounting influence

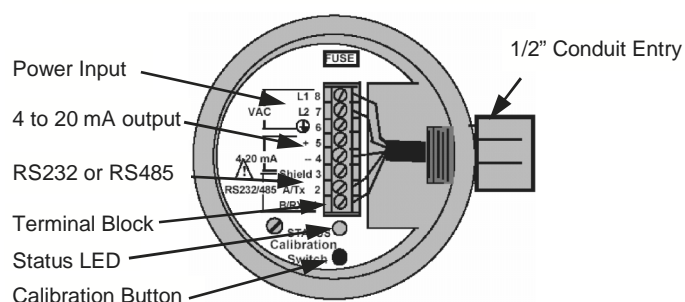
## Applications

- Food
- Beverage
- Water / Wastewater
- Chemicals



The SmartWave is a very accurate, noiseless and self-adjusting pulse radar transmitter for distances up to 100 feet. The SmartWave adjusts microwave pulse amplitude and its width to a target distance and target reflection properties. The receiver changes its sensitivity with the amplitude of received echoes. In addition, the unit analyzes the shapes of the received echoes and eliminates the ones coming from tank walls, standpipes and other obstructions. These features allow the SmartWave to track any wanted target from the tip of the rod antenna to the bottom of the tank, regardless of the tank shape or environmental conditions.

**Top View of Transmitter with Access Cover Removed**



## Mechanical

Conduit Entry: 1/2"  
NPT  
Enclosure:  
Aluminum-94VO (optional SS)  
Enclosure Rating: NEMA 4X(IP65)

## Environmental

Temperature:  
-40 to 140° F (-40 to 60° C)  
Pressure:  
1 bar  
Approvals:  
NEMA 4 Ingress Protection

## Operational

Operation  
Pulse Radar  
Frequency  
6.3 GHz  
Accuracy:  
+/- 0.25% of maximum target range  
Loss of echo: Hold 30 seconds, 22 mA  
Transmitter Power  
50 uW average  
Calibration:  
programmable Push-button or programmable

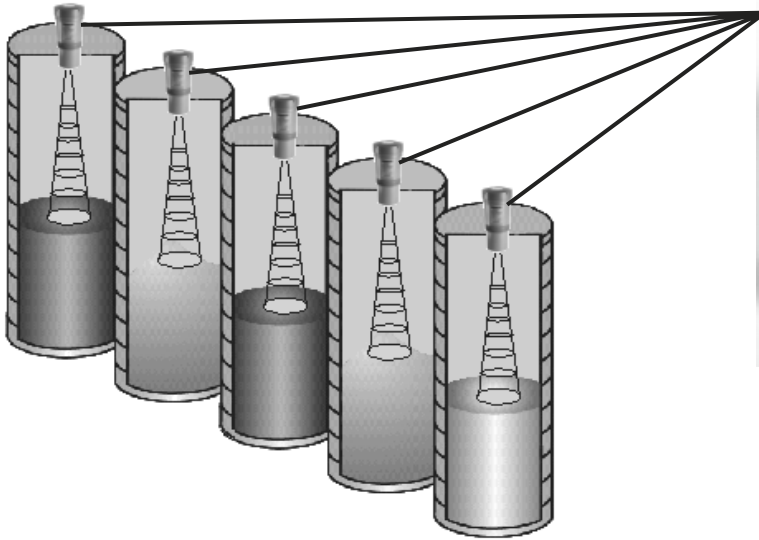
## Technical Specifications

	MODEL	RANGE	RESOLUTION	MOUNTING
110/230 VAC—4 Wire	SS400-050R & RC	Antenna Tip—50 ft Antenna Tip—15 m	0.22" 5.7 mm	2.0" NPT
	SS400-100R & RC	Antenna Tip—100 ft Antenna Tip—30 m	0.44" 11 mm	2.0" NPT
12 to 30 VDC—3 Wire	SS300-050R & RC	Antenna Tip—50 ft Antenna Tip—15 m	0.22" 5.7 mm	2.0" NPT
	SS300-100R & RC	Antenna Tip—100 ft Antenna Tip—30 m	0.44" 11 mm	2.0" NPT



# Display Modules & Enclosure

1-800-278-4241



BinMaster SmartSonic/SmartWave Display Module Enclosure with 5 Bargraph Display Modules

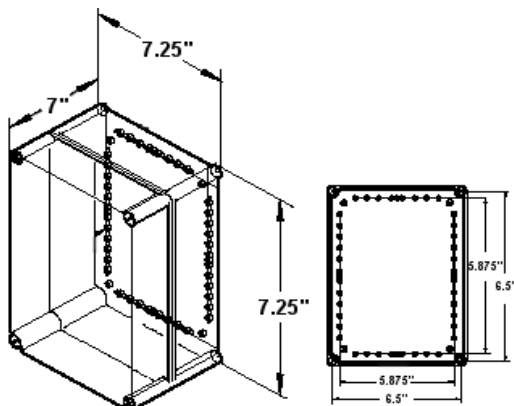
The bargraph display modules can be used with any of the SmartSonic or SmartWave Transmitters for remote indication of tank level. The display modules are available with optional relay outputs to provide process control and local alarms, and process loop analog output modules to be used to retransmit measurement data to a PLC/DCS or other analog devices.

The NEMA-4X Display Module Enclosure houses up to 5 display modules. This cabinet is made from high impact polycarbonate material and will withstand harsh industrial environments.

## General Features

- Optional configurations to match your specific operational needs
- Auto-sensing AC/DC power supply for voltages between 85-265 VAC / 95-370 VDC; 15-48 VAC / 10-72 VDC
- Output options include analog current loop and relay outputs
- Optional dual set points with easy adjustment from the front of the display

## Display Module Enclosure Specifications



## Optional Display Modules



A Versatile, Modular Bargraph Display with Optional Dual Setpoints and Relay Outputs



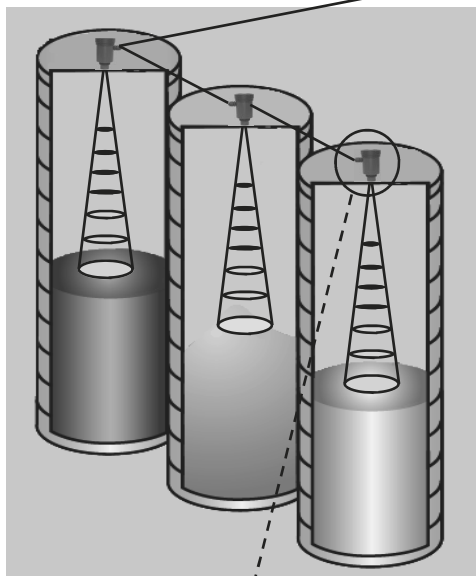
A Versatile, 51 Segment Bargraph with a 4-Digit LED Display with Relay and Analog Outputs Standard

\* Modules with additional features available

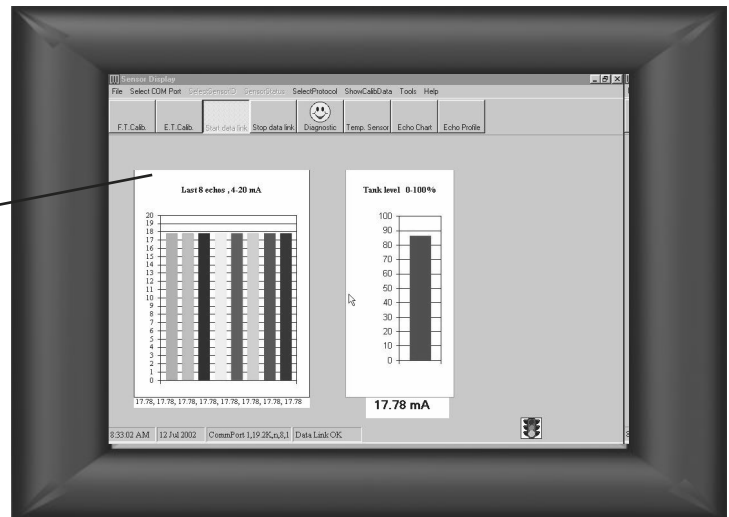
## PC Based Software

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A single RS-485 data cable connects the PC running software with up to 128 SmartSonic and/or SmartWave transmitters



**Main PC Screen**

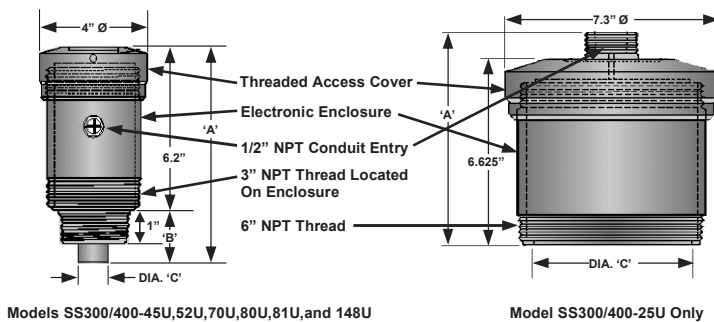


## Provides Direct PC Based Inventory Management

Built-in communication with a PC allows storage of the current output and temperature in a data logger. The data logger is linked with Microsoft Excel™. Up to 128 SmartSonic or SmartWave transmitters can be connected using RS-485 communication or a single transmitter can communicate directly with a PC using RS-232 communication. The PC software can provide a full diagnostic check including loss of echo, temperature sensor failure, noise error, and other conditions. A user can also see on the computer screen the echo profiles and echo stability chart. Through communications, some parameters can be changed, and also, a fixed point and programmable calibrations can be completed.

The SmartSonic Transmitter is available with an optional self-aligning carbon steel 3" ball and socket flange that provides a vertical connection for vessels with a radius dome or angled roof top and provides easy aiming flexibility.

## SmartSonic Ultrasonic Transmitter Technical Specifications

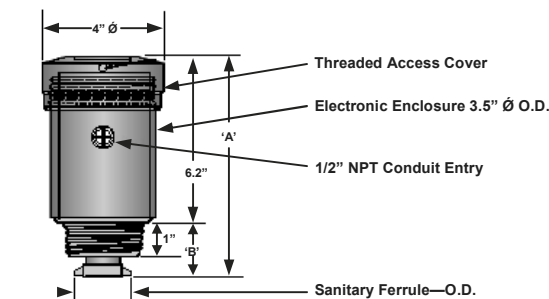


Models SS300/400-45U,52U,70U,80U,81U, and 148U

Model SS300/400-25U Only

MODEL	OPERATING RANGE	MOUNTING THREAD	DIMENSION 'A'	DIMENSION 'B'	DIMENSION 'C'
SS300/400-25U & UC	90 ft 27.4 m	6.0"/1.0" NPT	7.625"	N/A	5.75"
SS300/400-45U & UC	60 ft 18.2 m	3.0" NPT	8.9"	3.0"	3.0"
SS300/400-52U & UC	50 ft 15.2 m	3.0" or 2.0" NPT	9.3"	3.05"	2.2"
SS300/400-70U & UC	30 ft 9.1 m	3.0" or 2.0" NPT	8.5"	2.25"	1.8"
SS300/400-80U & UC	20 ft 6.1 m	3.0" or 2.0" NPT	8.5"	2.25"	1.8"
SS300/400-81U & UC	16 ft 4.9 m	3.0" or 1.5" NPT	8.4"	2.1"	1.5"
SS300/400-148U & UC	9 ft 2.7 m	3.0" or 1.0" NPT	8.25"	2.0"	1.1"

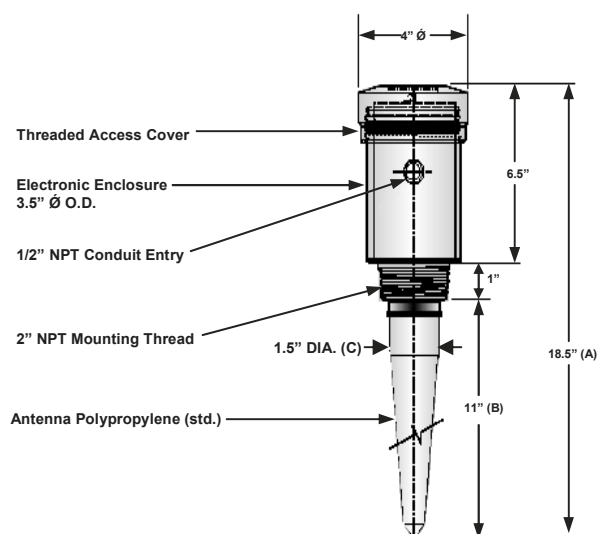
## SmartSonic Sanitary Ultrasonic Transmitter Technical Specifications



Models SS300/400-70US,80US,81US, and 148US

MODEL	OPERATING RANGE	MOUNTING THREAD	DIMENSION 'A'	DIMENSION 'B'	SANITARY FERRULE 1.5"	SANITARY FERRULE 2"
SS300/400-70US & USC	30 ft 9.1 m	N/A	8.5"	2.25"	N/A	2.5"
SS300/400-80US & USC	20 ft 6.1 m	N/A	8.5"	2.25"	N/A	2.5"
SS300/400-81US & USC	16 ft 4.9 m	N/A	8.4"	2.1"	1.9"	2.5"
SS300/400-148US & USC	9 ft 2.7 m	N/A	8.25"	2.0"	1.9"	2.5"

## SmartWave Pulse Radar Transmitter Technical Specifications



Models SS300/400-70US,80US,81US, and 148US

MODEL	OPERATING RANGE	MOUNTING THREAD	DIMENSION 'A'	DIMENSION 'B'	DIMENSION 'C'
SS300/400-050R & 050RC	50 ft 15 m	2.0" NPT	18.5"	11.0"	1.5" dia.
SS300/400-100R & 100RC	100 ft 30 m	2.0" NPT	18.5"	11.0"	1.5" dia.